OPTIMIZATION OF AN ADDER BASED CIRCUIT ARCHITECTURE

ABSTRACT OF THE DISCLOSURE

An adder based circuit embodied in an integrated circuit includes an input module, a carry module and an output module. The carry module has a minimum depth defined by a recursive expansion of at least one function associated with the carry module based on a variable k derived from a Fibonacci series. Invertor, XOR, XNOR (more preferably, OR(NOT(a),b)) and multiplexer elements are selectively coupled to the input and output modules to configure the adder based circuit as a subtractor, adder-subtractor, incrementor, decrementor, incrementer-decrementor or absolute value calculator. A computer process of designing the adder base circuit recursively expands the functions, and optimization of depth, fanout and distribution of negations is performed.